

recommend at about £200. The examination would consist of soundings around the entrance and the channels of the lakes and the bars of the rivers, borings to learn the nature of the strata at the entrance, guaging of the several rivers and the entrance to the lakes, together with a series of tidal observations, and the set of the currents and prevailing winds.

28. Trusting that you will approve of my course of action on this matter,

I have the honor to be, Sir, your obedient servant,

THOMAS E. RAWLINSON, Road Engineer.

NOTE.—Since my report on the lake entrance was submitted, the report of the District Surveyor on the same subject has been published, and I beg to call attention to its general tenor and statements.

Although written by a gentleman who has evident sympathies in favour of the feasibilities of the lake entrance, I think an impartial reader will perceive that the facts and admissions contained therein are nearly all more or less in support of the views which I have advanced on the subject.

Seeing that I have not the means of submitting the surveyor's report for the information of the members, I feel that it would be unfair to extend my comments on the same beyond this note.

The opinions advanced by me in the preceding report as to the difficulties and dangers of the entrance, are borne out by the recently issued report of the Chief Harbour Master, Capt. Ferguson.

17th Jan. 1865.

T. E. R.

Since the date of the report three sailing vessels have been lost and two steamers have been banked in.

T. E. R.

ART. XXIII.—*On the Determination of Personal Equation in Astronomical Observing.* By ROBERT L. J. ELLERY, Esq., F.R.A.S., Government Astronomer.

[Abstract of a paper read 2nd November, 1863.]

This was a short paper read principally to describe a small apparatus devised by Mr. Ellery for the purpose of obtaining the personal equation of different observers under conditions, as far as possible, similar to those under which the usual astronomical observations are made. It consists of an artificial star made to move across the field of view of the transit instrument at about the rate of an equatorial star, and to give a galvanic signal, on the chronograph apparatus, at the instant its position corresponds with the centre wire of the Micrometer, the observer also making a signal at the instant he observed the star to cross it. The difference of time, as shown on the chronograph, obtained for each observer, gives the means of ascertaining the personal

equation of each. The artificial star, which was made to transit alternately from right and left, was contrived by bringing a minute pencil of light to a focus in the place of the wires of one of the collimating telescopes of the transit instrument.

Mr. Ellery stated that the apparatus had not been brought thoroughly into use yet, but from a few trials he hoped it would be found to be a very easy and accurate method of making this somewhat troublesome determination. He promised at some future time to communicate the result of his experience with this apparatus.

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ART. XXIV.—*Description of a Pendulum Apparatus for Determining the Length of a Seconds' Pendulum in Melbourne.* By Professor NEUMAYER.

[Abstract of paper read 31st August, 1863.]

This paper was illustrated by some large drawings which thoroughly explained the peculiarity of the pendulum used by Professor Neumayer, as compared with Bessel's, Captain Katers, &c.

The pendulum itself was constructed by Mr. Lohmeir, of Hamburg, under the supervision of Professor Peters, of the Altona Observatory. It was reversible by two knife edges, and was adjusted with such nicety that there remained a difference of only 0.00024 of a second between the duration of an oscillation in both positions of the pendulum. The measuring apparatus consisted of a frame with two micrometer microscopes, in which either the pendulum or a scale (a copy of Bessel's Prussian Standard) could be suspended, and the knife edges in one case or the divisions of the scale in the other brought under the micrometers. This apparatus was constructed, under Professor Neumayer's own supervision, by Mr. H. Schreiber, of Melbourne. The micrometer was capable of measuring to 0.0017 of an English inch. The whole apparatus was conveniently fitted up in a cellar under Professor Neumayer's house. The clock used was one by Shepherd, of London, and was comparable by means of a telegraphic needle connected by a wire with the standard clock of the Melbourne Observatory, about 500 yards distant. Comparisons were generally made three times a day. The coincidences were